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## REMARKS

Upon entry of this amendment, claims 13-15, 19-21 are present for consideration. Previously, Claims 1-11, 12-21 were pending in the Application. Claims 1-12 and 16-18 are canceled without prejudice or disclaimer. Claims 13 and 21 are amended.

Support for the amendments to claims 13 and 21 are found in the specification at least on p. 4, line 32 to p. 5, line 14; and p.5, lines 22-29; and p. 6, lines 27-30. Thus no new matter is introduced with this amendment.

Applicants respectfully request reconsideration based on the following remarks.  
Applicants respectfully submit that the claims as presented are in condition for allowance.

### *Claim Rejections Under 35 U.S.C. §103*

Claims 1-2, 5-8 and 12 were rejected under 35 U.S.C. 103(a) as being allegedly unpatentable over Cantor et al. (U.S. Patent No. 5,795,714) in view of Koster et al. (U. S. Patent 6,133,436).

Claims 1-2, 5-8 and 12 are canceled, rendering this rejection moot.

Claims 3-4, 9-10, and 13 were rejected under 35 U.S.C. 103(a) as being allegedly unpatentable over Cantor et al. (U.S. Patent No. 5,795,714) in view of Koster et al. (U.S. Patent No. 6,133,436) in further view of Dickinson et al. (U. S. Patent 6,770,441). Although not explicitly state to be so on p. 5 of the Office Action, Claims 18-21 also appear to be rejected under 35 U.S.C. 103(a) as being allegedly unpatentable over these same references based on the arguments on p. 7.

This rejection is moot for Claims 3-4, 9-10 and 18 as these claims are canceled. However, Applicants respectfully traverse this rejection for Claims 13 and 19-21 for the following reasons.

Applicants argue that the Examiner has failed to establish a *prima facie* case of obviousness, and therefore, the obviousness rejection under 35 U.S.C. §103(a) is improper.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir.

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1988). Establishing a prima facie case of obviousness requires that all elements of the invention be disclosed in the prior art. *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970).

Applicants independent claim 13 recites the following elements “the surface of the first substrate is patterned by photolithography with a metallic pattern having protruding portions” and that “the uneven substrate is patterned with recessed portions by photolithography”. Applicants independent claim 21 includes the same elements

Applicants can find no teaching or suggestion in Cantor et al., Koster et al. or Dickinson et al. that the surface of a first substrate is patterned by photolithography with a metallic pattern having protruding portions or that an uneven substrate is patterned with recessed portions by photolithography.

Moreover, claims 13 and 21 also include the following elements: “the primer binding sites of the immobilized first nucleic acid probes have various base sequences”. Claim 13 additionally includes the element “each primer in the plurality of primers is identical in base sequence” while claim 21 includes the element “binding a universal primer to the primer binding site of each of the first nucleic acid probes immobilized on the surface of the first substrate of the template nucleic acid array”. The Examiner stated that Cantor teaches a “universal primer”, but Applicants found no such term in searching a searchable version of Cantor. The following is the text found in the particular place in Cantor cited by the Examiner (col 21, lines 55-65):

[A master array is made and ]used to transfer components of the replicas in a sequence-specific way. The sequences to be transferred are designed so that they contain the desired 5 or 6 base 5' variable overhang adjacent to a unique 15 base DNA sequence.

The master array consists of a set of streptavidin bead-impregnated plastic coated metal pins, each of which, at its tip, contains immobilized biotinylated DNA strands that consist of the variable 5 or 6 base segment plus the constant 15 base segment. Any unoccupied sites on this surface are filled with excess free biotin. To produce a replica chip, the master array is incubated with *the complement of the 15 [base constant sequence, 5' -labeled with biotin. ]* (Emphasis added. Adjoining portions are included in brackets to provide complete sentences for the cited section of Cantor)

There is in this quotation from Cantor et al. reference to the complement of a 15 base constant sequence of immobilized nucleic acids attached to the support (See the italicized phrase), however the

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*complement* of such a *constant* base sequence would be another *constant* sequence, not a *variable* sequence.

Further, Claims 13 and 21 indicate that the primer binding sites of the first nucleic acid probes have *various* base sequences, not a *constant* sequence. Applicants can find no place in Cantor where a universal primer or "each primer in the plurality of primers is identical in base sequence" is taught or suggested. Applicants also find no place in Cantor where such a universal primer for subsequent nucleotide synthesis is hybridized to immobilized nucleic acids with primer binding sites of variable sequence.

As the combination of references fails to have all the elements of independent claims 13 and 21, Applicants assert that a *prima facie* case of obviousness has not been established for independent claims 13 and 21 or for claims 19-20 which depend from claim 13, over Cantor et al. in view of Koster et al. in further view of Dickinson et al.

Consequently, Applicants respectfully request reconsideration and withdrawal of this rejection of claims 13 and 19-21.

Claims 14-15 were rejected under 35 U.S.C. 103(a) as being allegedly unpatentable over Cantor et al. (U.S. Patent No. 5,795,714) in view of Koster et al. (U. S. Patent 6,133,436) in further view of Dickinson et al. (U. S. Patent 6,770,441), in further view of Yan et al. (U.S. Patent 5,830,539). Applicants respectfully traverse this rejection for the following reasons.

The Office Action stated that Cantor et al., Koster et al., and Dickinson et al. teach all elements of claims 14-15 except for a platinum pattern and that Yan et al. teach immobilizing nucleic acids on a platinum substrate (col. 51, Examples 46-47).

Applicants note that in Examples 46 and 47 of Yan et al. that the *entire* substrate is platinum, whereas in the invention of claims 14-15 a protruding metallic pattern, for example of platinum, is formed on a substrate. Therefore Yan et al. does not provide the protruding metallic pattern recited in claims 14-15.

Furthermore, Claims 14-15 depend from claim 13. As argued above, the combination of Cantor et al., Koster et al. and Dickinson et al. fail to have the following elements of independent claim 13: "the surface of the first substrate is patterned by photolithography with a metallic pattern having protruding portions" and that "the uneven substrate is patterned with recessed portions by photolithography". Therefore, for Yan et al. must also supply these elements. The

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Office Action does not allege that Yan et al. teach or suggest these elements. Applicants can find no place in Yan et al. that teach or suggest these elements.

Therefore, as all elements of claims 14-15 are not present in the combination of references, Applicants assert that no *prima facie* case of obviousness of claims 14-15 has been established.

Applicants respectfully request reconsideration and withdrawal of the rejection of claims 14-15 under 35 U.S.C. 103(a) as being allegedly unpatentable over Cantor et al. (U.S. Patent No. 5,795,714) in view of Koster et al. (U. S. Patent 6,133,436) in further view of Dickinson et al. (U. S. Patent 6,770,441), in further view of Yan et al.

Claims 16-17 were rejected under 35 U.S.C. 103(a) as being unpatentable over Cantor et al. in view of Koster et al., in further view of Dickinson et al. (US 6,770,044), in further view of Nikiforov et al. (US 5,610,287). Claims 16-17 are canceled, however the elements of canceled claims 16-17 have been added to independent claims 13 and 21. Therefore, Applicants respectfully traverse this rejection with respect to claims 13 and 19-21.

The Examiner stated that Cantor et al., Koster et al., and Dickinson et al. teach all elements of previous claims 16-17 except for disclosing patterning by photolithography and that Nikiforov et al. discloses such patterning. However, the Examiner has not indicated where Nikiforov et al. disclose patterning by photolithography. By doing a search for "photolithography" in a searchable version of Nikiforov et al., Applicants found only one location in Nikiforov et al. where photolithography was mentioned. At col. 24, lines 17-21, Nikiforov et al. state:

"Pattern-specific deposition *should* be possible using silk-screening and ink-jet technologies, as well as photolithography to mask areas of the substrate to prevent oligonucleotide binding."  
(Emphasis added)

This statement does not teach forming protrusions or recesses on a substrate by photolithography as required by claims 13 and 21. It merely suggests masking regions of a substrate to prevent nucleic acid binding.

Thus, the combination of references, Cantor et al., Koster et al., Dickinson and Nikiforov et al. fail to provide either of the following elements present in independent claims 13 and 21: "the surface of the first substrate is patterned by photolithography with a metallic pattern having protruding portions" and "the uneven substrate is patterned with recessed portions by photolithography". Applicants therefore assert that a *prima facie* case of obviousness can not be

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established for amended independent claims 13 and 21 or for claims 19-20 which depend from claim 13, over Cantor et al. in view of Koster et al. in further view of Dickinson et al. and Nikiforov et al. as the combination of references does not provide all the elements of the claims.

Further, even assuming that all elements of an invention are disclosed in the prior art, an Examiner cannot establish obviousness by locating references that describe various aspects of a patent applicant's invention without also providing evidence of the motivating force which would have impelled one skilled in the art to do what the patent applicant has done. *Ex parte Levingood*, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. Int. 1993). The references, when viewed by themselves and not in retrospect, must suggest the invention. *In Re Skoll*, 187 U.S.P.Q. 481 (C.C.P.A. 1975).

In applying Section 103, the U.S. Court of Appeals for the Federal Circuit has consistently held that one must consider both the invention and the prior art "as a whole", not from improper hindsight gained from consideration of the claimed invention. See, *Interconnect Planning Corp. v. Feil*, 227 U.S.P.Q. 543, 551 (Fed. Cir. 1985) and cases cited therein. According to the *Interconnect* court

[n]ot only must the claimed invention as a whole be evaluated, but so also must the references as a whole, so that their teachings are applied in the context of their significance to a technician at the time - a technician without our knowledge of the solution. *Id.*

When, as here, the Section 103 rejection was based on selective combination of the prior art references to allegedly render a subsequent invention obvious, "there must be some reason for the combination other than the hind sight gleaned from the invention itself." *Id.* Stated in another way, "[i]t is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious." *In re Fritch* 23 U.S.P.Q.2d 1780, 1784 (Fed. Cir. 1992).

The Examiner has provided no indication of the motivation provided within the references to combine the references other than a conclusory statement that it would have been obvious to a practitioner of ordinary skill in the art at the time the invention was made to incorporate patterning of substrates through photolithography into the methods of Cantor, Koster and Dickinson "since Nikiforov suggest such a modification for the purposes masking areas of substrates to prevent oligonucleotide binding."

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Further, in the quote above from Nikiforov, the use of the verb "should" suggests to Applicants that even for prevention of nucleic acid binding, Nikiforov et al. are uncertain as to whether their suggestion is capable of success. Thus Applicants assert that the combination also fails to provide the required expectation of success.

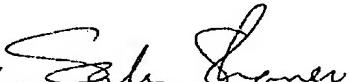
For all the above reasons, Applicants request reconsideration and withdrawal of the rejection of claims 13, 19-21 under 35 U.S.C. 103(a) as being unpatentable over Cantor et al. in view of Koster et al., in further view of Dickinson et al. (US 6,770,044), in further view of Nikiforov et al. (US 5,610,287).

***Conclusion***

In view of the foregoing, it is respectfully submitted that the instant application is in condition for allowance. Accordingly, it is respectfully requested that this application be allowed and a Notice of Allowance issued. If the Examiner believes that a telephone conference with Applicants' attorneys would be advantageous to the disposition of this case, the Examiner is cordially requested to telephone the undersigned.

In the event the Commissioner of Patents and Trademarks deems additional fees to be due in connection with this application, Applicants' attorney hereby authorizes that such fee be charged to Deposit Account No. 06-1130.

Respectfully submitted,  
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